

### REMARKS

Claims 1-18 are pending. Claims 1, 10 and 11 have been amended. No new matter has been added. Reconsideration is respectfully requested in view of the forgoing amendment and these remarks.

Claim 10 was objected to as impeding clear understanding as written. Applicant believes that the claim as amended is clear.

Claims 1-8 and 11-15 were rejected under 35 U.S.C. 103(a) as being unpatentable over B. Mikkelsen, et al., *40 Gbit/s all-optical wavelength converter and RZ-to-NRZ format adapter realised by monolithic integrated active Michelson Interferometer*, Electronics Letters, January 1997, ("Mikkelsen") in view of Hyuek Jae Lee, et al., *Polarisation-independent, stable, all-optical clock recovery using an SOA/grating filter wavelength converter*, Electronics Letters, August 1999, ("Jae Lee"). Claims 16-17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Mikkelsen in view of Jae Lee and further in view of U.S. Patent No. 6469823 B2 to Kikuchi et al., ("Kikuchi"). Claims 9-10 and 18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Jae Lee in view of Kikuchi. Applicant respectfully traverses the rejections.

Claim 1 as amended requires a bit error rate tester. The tester comprises an optical multiplexer for multiplexing a plurality of input signals and supplying a plurality of test pattern data signals for injection into a device under test. The tester further comprises an optical pulse source from which an optical pulse stream is provided to the optical multiplexer to be modulated with the at least one test pattern data signal multiplexed therein.

Applicant agrees with the Examiner that Mikkelsen discloses an optical multiplexer for multiplexing at least one test pattern data signal for injection into a device under test. Applicant further submit that both Jae Lee and Mikkelsen disclose providing an optical pulse stream to a modulator. Applicant respectfully submits, however, that the experimental setups in Mikkelsen and Jae Lee neither disclose nor suggest a multiplexer for multiplexing a plurality of input signals and supplying a plurality of test pattern data signals for injection into a device under test as required by claim 1. Since this limitation is neither disclosed nor suggested by either

Mikkelsen or Jae Lee, Applicant respectfully submits that claim 1 is allowable. Claims 2-8 depend, either directly or indirectly, from claim 1 and are allowable for at least the reasons claim 1 is allowable.

Claims 2-8 contain additional non-obvious limitations that distinguish claims 2-8 from obvious combinations of Jae Lee and Mikkelsen. Claim 3, for example, requires in relevant part, an optical converter adapted to convert an optical RZ signal into an optical NRZ signal and an electrical NRZ for injection into a device under test. Applicant submits that neither Jae Lee nor Mikkelsen discloses or suggests providing an electrical NRZ signal for injection into a device under test as required by claim 3. Further, Applicant submits that neither Jae Lee nor Mikkelsen discloses or suggests providing an optical NRZ signal for injection into a device under test. In the experimental set-up of Mikkelsen, the RZ-to-NRZ converter *is* the device under test. (Fig. 1.) Applicant submits that after the Michelson interferometer of Mikkelsen performs RZ-to-NRZ conversion, the signal is supplied to a demultiplexer and a BER for analysis, rather than to a device under test. For the forgoing reasons, Applicant submits that claim 3 is allowable over Mikkelsen and Jae Lee independent of the reasons set forth above with respect to claim 1.

Claim 9 requires in relevant part a first optical converter adapted to convert a first optical RZ signal having a first data rate into a first optical NRZ signal having the first data rate and a first electrical NRZ signal having the first data rate, the first optical and electrical NRZ signals for injection into a device under test. Claim 9 also requires a second optical converter adapted to convert a second optical NRZ signal having a second data rate into a second optical RZ signal having the second data rate.

Applicant respectfully submits that these limitations are neither disclosed nor suggested by Mikkelsen and Kikuchi. Applicant submits initially that neither Kikuchi nor Jae Lee disclose an optical converter that converts an optical signal into an electrical signal for injection into a device under test, as required by claim 9, because in part, the wavelength converter of Kikuchi is not a piece of test equipment. Moreover, Applicant submits that neither Mikkelsen nor Kikuchi discloses or suggests converting a RZ signal to a NRZ signal for injection into a device under test, as required by 9. As set forth above with respect to claim 3, the Michelson interferometer of

Mikkelsen *is* the device under test, and after the Michelson interferometer of Mikkelsen performs RZ-to-NRZ conversion, the signal is demultiplexed and supplied to a BER tester rather than supplied to a device under test. (Fig. 1). Additionally, Applicant submits that none of the cited references disclose a first and a second optical converters for converting signals of a first and a second respective data rate as required by claim 9. Applicant agrees with the Examiner that Kikuchi discloses multiple optical converters, e.g., elements 102 and 104 in Fig. 1. Applicant submits, however, that there is no disclosure or suggestion in Kikuchi that the optical wavelength converters of Kikuchi are converting a first optical signal of a first data rate and a second optical signal of a second data rate as required by claim 9. Applicant acknowledges that Kikuchi discloses multiple wavelength converters converting data signals of different *wavelengths*, e.g., 1.3um and 1.5um in Fig. 1, but submits that signals of a first and second wavelength is not the same as signals of a first and second data rate. Mikkelsen makes the distinction between data rate and signal wavelength clear: “[e]xamples of measured pulse patterns of the 40Gbit/s RZ input signal at 1558nm and the converted 1562nm NRZ signal are shown in Fig. 2 as the upper traces...” (Page 2, Col. 1). Mikkelsen only discloses optical conversion of RZ-to-NRZ signals at one data rate: 40 Gbit/s. Kikuchi is silent on the issue of data rate.

For all of the foregoing reasons, Applicant respectfully submits that claim 9 is allowable over Mikkelsen and Kikuchi. Claim 10 depends directly from claim 9 and is allowable for at least the reasons claim 9 is allowable.

Claim 11 as amended requires a method of bit error rate testing. The method comprises optically multiplexing a plurality of test pattern data signals for injection into a device under test. Applicant submits that neither Mikkelsen nor Jae Lee discloses multiplexing a plurality of test pattern data signals for injection into a device under test. Applicant submits that Mikkelsen discloses multiplexing only a single 40Gbit/s signal for the purposes of evaluating a RZ-to-NRZ and wavelength converter. (Fig. 1). Since Mikkelsen and Jae Lee do not disclose or suggest the limitation of multiplexing a plurality of test pattern data signals, Applicant submits that claim 11 as amended is allowable over Mikkelsen and Jae Lee. Claims 12 –17 depend either directly or indirectly from claim 11 and are allowable for at least the reasons claim 11 is allowable.

Claim 18 requires a method of bit error rate testing. The method requires in relevant part, optical converting a first optical RZ signal into a first optical NRZ signal having the first data rate and a first electrical NRZ signal having the first data rate. The first optical NRZ signal and the first electrical NRZ signal are for injection into a device under test. The method also requires in relevant part optical converting a second optical NRZ signal having a second data rate into a second optical RZ signal have the second data rate.

Applicant respectfully submits that no obvious combination of Jae Lee and Mikkelsen discloses these limitations. Applicant submits initially that neither Kikuchi nor Jae Lee disclose an optical converter that converts an optical signal into an electrical signal for injection into a device under test, as required by claim 18, because in part, the wavelength converter of Kikuchi is not a piece of test equipment. Moreover, Applicant submits that neither Mikkelsen nor Kikuchi discloses or suggests converting a RZ signal to a NRZ signal for injection into a device under test, as required by 18. As set forth above with respect to claim 3, the Michelson interferometer of Mikkelsen *is* the device under test, and after the Michelson interferometer of Mikkelsen performs RZ-to-NRZ conversion, the signal is demultiplexed and supplied to a BER tester rather than supplied to a device under test. (Fig. 1). Additionally, Applicant submits that none of the cited references disclose converting signals of a first and a second respective data rate as required by claim 18. Applicant agrees with the Examiner that Kikuchi discloses multiple optical converters, e.g., elements 102 and 104 in Fig. 1. Applicant submits, however, that there is no disclosure or suggestion in Kikuchi that the optical wavelength converters of Kikuchi are converting a first optical signal of a first data rate and a second optical signal of a second data rate as required by claim 18. Applicant acknowledges that Kikuchi discloses multiple wavelength converters converting data signals of different *wavelengths*, e.g., 1.3um and 1.5um in Fig. 1, but submits that signals of a first and second wavelength is not the same as signals of a first and second data rate. Mikkelsen makes the distinction between data rate and signal wavelength clear: “[e]xamples of measured pulse patterns of the 40Gbit/s RZ input signal at 1558nm and the converted 1562nm NRZ signal are shown in Fig. 2 as the upper traces...” (Page

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Filed : November 16, 2001  
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2, Col. 1). Mikkelsen only discloses optical conversion of RZ-to-NRZ signals at one data rate: 40 Gbit/s. Kikuchi is silent on the issue of data rate.

For all of the foregoing reasons, Applicant respectfully submits that claim 18 is allowable over Mikkelsen and Kikuchi.

Enclosed is a \$110.00 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: 8/26/01



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